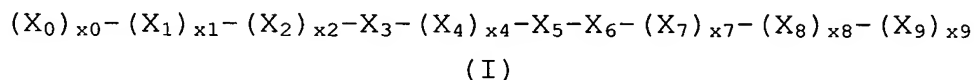


## CLAIMS

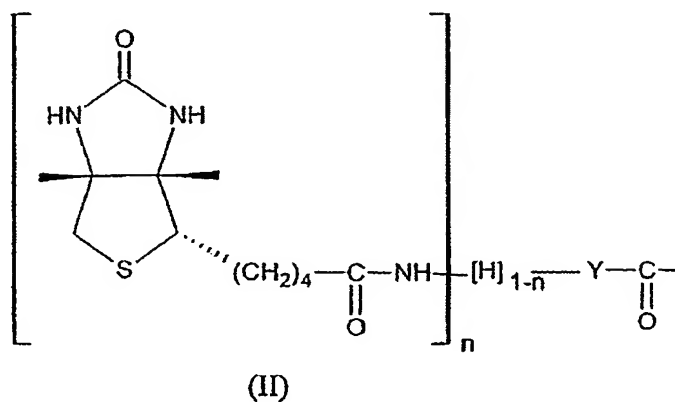
1. A molecule of general formula (I), and the pharmaceutically acceptable salts thereof:



in which

-  $x_0$ ,  $x_1$ ,  $x_2$ ,  $x_4$ ,  $x_7$ ,  $x_8$  and  $x_9$  each represent, independently, an integer equal to 0 or to 1;

-  $X_0$  represents a group chosen from those corresponding to formula (II):

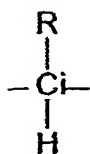


in which Y represents a saturated or unsaturated, linear, branched or cyclic  $C_1$ - $C_{24}$  alkyl group, n represents an integer chosen from 0 and 1;

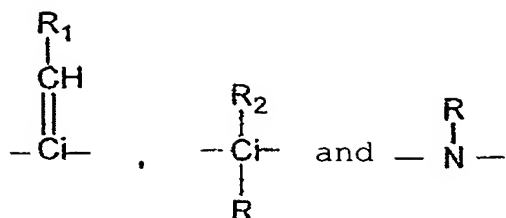
-  $X_1$  and  $X_3$  each represent a natural or synthetic amino acid in the L or D configuration, each comprising at least one hydroxyl function on its side chain;

-  $X_2$  represents a natural or synthetic amino acid in the L or D configuration chosen from those comprising an alkyl side chain;

- $X_4$  represents a natural or synthetic amino acid in the L or D configuration which can be chosen from those comprising an aromatic side chain;
- $X_5$  represents an amino acid in the L or D configuration chosen from lysine, arginine, histidine, aspartic acid, asparagine, glutamic acid and glutamine;
- $X_6$  represents an amino acid in the L or D configuration which can be chosen from tyrosine, phenylalanine, leucine, isoleucine, alanine, *para*-benzoylphenylalanine and lysine;
- $X_7$  represents an amino acid in the L or D configuration which can be chosen from glycine, alanine, leucine, valine, asparagine and arginine;
- $X_8$  represents an amino acid in the L or D configuration which can be chosen from proline, valine, isoleucine and aspartic acid;
- $X_9$  represents an amino acid in the L or D configuration which can be chosen from serine, alanine, lysine, arginine and tryptophan;
- the bond between two successive amino acids  $X_i-X_{i+1}$ , denoted  $q_{i-i+1}$ ,  $i = 1, \dots, 8$ , can be a peptide bond  $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{NH}- \end{array}$  or a pseudopeptide bond chosen from: CO-O, CO-S, CO-CH<sub>2</sub>, CO-N(Me), NH-CO, CH=CH, CH<sub>2</sub>-CH<sub>2</sub>, CH<sub>2</sub>-S, CH<sub>2</sub>-O, CS-NH, CH<sub>2</sub>-NH, CO-CH<sub>2</sub>-NH, CO-NH-NH, CO-NH-N= and CO-N(NH<sub>2</sub>);
- the amino acids stated above  $X_i$ ,  $i = 1, \dots, 9$ , being capable of comprising a modification of their  $\alpha$ -carbon, denoted  $C_i$ ,  $i = 1, \dots, 9$ , and bearing the side chain R of the amino acid, which modification consisting of the replacement of:



with a group chosen from:



the groups R and CH-R<sub>1</sub> representing the side chain of the amino acid and R<sub>2</sub> representing a C<sub>1</sub>-C<sub>6</sub> alkyl group; R-R<sub>2</sub> can constitute a ring,

5 - the pseudopeptides of the invention also corresponding to the following conditions:

· x<sub>0</sub> is equal to 1

or

10 · one of the bonds q<sub>i-i+1</sub>, i = 1,...8, is a pseudopeptide bond

or

· one of the C<sub>i</sub>, i = 1,...9, comprises one of the modifications stated above.

15 2. A molecule as claimed in claim 1, characterized in that one or more of the following conditions is verified:

at least one of the integers x<sub>0</sub>, x<sub>1</sub>, x<sub>2</sub>, x<sub>4</sub>, x<sub>7</sub>, x<sub>8</sub> and x<sub>9</sub> is equal to 1;

20 X<sub>1</sub> and X<sub>3</sub>, which may be identical or different, are chosen from threonine and serine;

X<sub>2</sub> is chosen from valine, leucine and isoleucine;

X<sub>4</sub> is chosen from phenylalanine, tryptophan, tyrosine and *para*-benzoylphenylalanine.

25

3. A molecule as claimed in claim 1 or claim 2, characterized in that it comprises 4 to 8 amino acids, preferably 5 to 7 amino acids, even more preferably 6 amino acids.

30

4. A molecule as claimed in any one of claims 1 to 3, characterized in that x<sub>0</sub> = 1 and the acyl chain -Y-CO- is a linear chain which is represented by the formula -C<sub>p</sub>H<sub>2p</sub>-CO-, p being an integer ranging from 1 to 23.

35

5. A molecule as claimed in claim 4, characterized in that:

- when  $n = 1$ , Y represents  $-C_pH_{2p}-$  and p can be 1, 2, 3, 4, 5, 6, 7 or 8;

5 - when  $n = 0$ , Y represents  $-C_pH_{2p}-$  and p can be an integer ranging from 5 to 23.

6. A molecule as claimed in any one of the preceding claims, characterized in that one or more of the  
10 following conditions are verified:

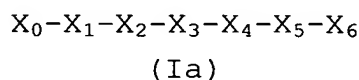
- at least one of  $X_1$  and of  $X_3$  represents threonine, preferably  $X_1$  and  $X_3$  both represent threonine,

-  $X_2$  is chosen from isoleucine and valine,

-  $X_4$  is chosen from phenylalanine, tyrosine and para-  
15 benzoylphenylalanine,

- at least 2 of the integers  $x_0, x_1, x_2, x_4, x_7, x_8$  and  $x_9$  are equal to 1, even more preferably at least 3 of these integers are equal to 1.

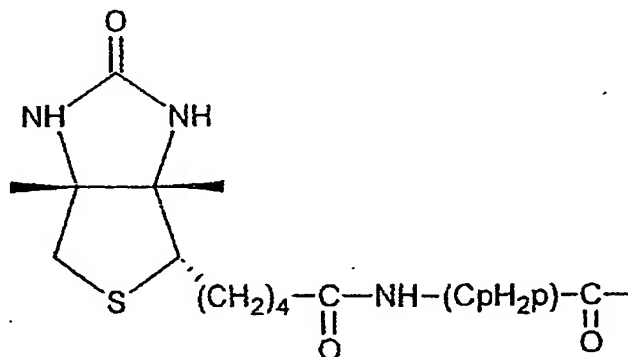
20 7. A molecule as claimed in claim 1, characterized in that it corresponds to formula (Ia):



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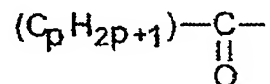
in which the bonds  $q_i, i+1$  between the amino acids  $X_i$  and  $X_{i+1}$ ,  $i = 1, \dots, 5$ , are peptide or pseudopeptide bonds.

8. A molecule as claimed in claim 7, characterized in  
30 that  $X_0$  represents:



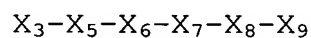
with p ranging from 1 to 8, preferably from 2 to 6,  
and X<sub>4</sub> represents a *para*-benzoylphenylalanine group.

- 5 9. A molecule as claimed in claim 7, characterized in  
that X<sub>0</sub> represents a group:



- 10 with p ranging from 3 to 23, preferably from 5 to 19.

10. A molecule as claimed in claim 1, characterized in  
that it corresponds to formula (Ib):



- 15 (Ib)

in which:

- at least one of the bonds between two successive  
amino acids is a pseudopeptide bond,

- 20 or

- one of the α-carbons of one of the amino acids is a  
modified α-carbon.

11. A molecule as claimed in claim 1, characterized in  
25 that it belongs to the list:

CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TVTYDY with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TISYDY with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TVSYKF with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TITFDY with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TITYKF with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TITYEY with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TITYDF with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TVTYKL with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TVTYKY with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TVTFKF with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TITYDL with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TITFDY with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TVTFKF with n=4,6,8,10,12,14,16,18  
CH<sub>3</sub>-(C<sub>n</sub>H<sub>2n</sub>)-CO-TVTYKF with n=4,6,8,10,12,14,16,18  
Biot-Ava-TVT-Bpa-KF  
Biot-Ava-TVT-Bpa-KY  
Biot-Ava-TVT-Bpa-KL  
Biot-Ava-TVT-Bpa-DF  
Biot-Ava-TVT-Bpa-DY  
Biot-Ava-TVT-Bpa-DL  
Biot-Ava-TIT-Bpa-KF  
Biot-Ava-TIT-Bpa-KY  
Biot-Ava-TIT-Bpa-KL  
Biot-Ava-TIT-Bpa-DF  
Biot-Ava-TIT-Bpa-DY  
Biot-Ava-TIT-Bpa-DL  
Biot-Ava-TVT-Bpa-EF  
Biot-Ava-TVT-Bpa-EY  
Biot-Ava-TVT-Bpa-EL  
Biot-Ava-TIT-Bpa-EF  
Biot-Ava-TIT-Bpa-EY  
Biot-Ava-TIT-Bpa-EL  
Biot-Ava-TVT-Bpa-NF  
Biot-Ava-TVT-Bpa-NY  
Biot-Ava-TVT-Bpa-NL  
Biot-Ava-TIT-Bpa-NF  
Biot-Ava-TIT-Bpa-NY

Biot-Ava-TIT-Bpa-NL

in which Biot represents a biotinyl group, Ava represents a  $\delta$ -aminovaleric acid group, Bpa represents  
5 a *para*-benzoylphenylalanine group

TNL\*GPS

SEK\*RVW

TRA\*LVR

SNL\*NDA

10 THI\*VIK, in which \* represents:

- a bond chosen from ester, thioester, keto methylene, keto methyleneamino, N-methylamide, inverse amide, Z/E vinylene, ethylene, methylenethio, methyleneoxy, thioamide, methyleneamino, hydrazino, carbonylhydrazone  
15 and N-amino bonds,

or

- the presence of an aza-amino acid as a substitution for one of the amino acids adjacent to \*.

20 12. A molecule, characterized in that it comprises a molecule as claimed in any one of claims 1 to 11 coupled, on its C-terminal end and/or on its N-terminal end, with another molecule which promotes its bioavailability.

25 13. A medicinal product, characterized in that it comprises a molecule as claimed in any one of claims 1 to 12, in a pharmaceutically acceptable carrier.

30 14. The use of a molecule as claimed in any one of claims 1 to 12, for preparing a medicinal product for use in the prevention and treatment of a pathology involving the proteasome.

35 15. The use as claimed in claim 14, characterized in that the pathology is selected from: cancers involving hematological tumors or solid tumors, autoimmune diseases, AIDS, inflammatory diseases, cardiac pathologies and the consequences of ischemic processes

whether at the myocardial, cerebral or pulmonary level, allograft rejection, amyotrophy, cerebral strokes, traumas, burns, pathologies associated with aging such as Alzheimer's disease and Parkinson's disease, and the  
5 appearance of the signs of aging.

16. The use as claimed in claim 14, for preparing medicinal products for use in the radiosensitization of a tumor.

10

17. A cosmetic and/or dermatological composition comprising a molecule as claimed in any one of claims 1 to 12, in a cosmetically and/or dermatologically acceptable carrier.

15

18. A cosmetic process for preventing or treating the appearance of the effects of chronological skin aging and/or of photoaging, characterized in that it comprises the application of a molecule as claimed in  
20 any one of claims 1 to 12, in a cosmetically acceptable carrier.